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UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

POTATO "NUTS"

A NEW TYPE OF SNACK

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DIRECT FRYING OF FRESH POTATO CUBES

The best results were obtained when fresh potatoes were sliced into 1/4-inch cubes and fried directly. Larger dice resulted in fried pieces having soft centers. Cubes smaller than 1/4 inch on a side tended to become excessively brown and hard on frying and would be difficult to process commercially. Frying time and firmness of centers are influenced by the total solids content of the potatoes used, which ranged from 17.5 to 22 percent. No study was made of possible product differences due to potato variety, but good quality "nuts" were prepared from Maine Katahdin and Idaho Russet Burbank potatoes, the only varieties used. Potato "nuts", like chips, have best color, taste, and texture if made from potatoes of low sugar content.

FRYING CONDITIONS

A thermostatically controlled electric fry kettle of 15-pound fat capacity was used. Peeled potatoes were sliced by a single pass through a power-driven vegetable dicer, washed to remove surface starch, drained, and then added to fat at 320° F. A charge of 2-3/4 pounds of potato dice was used in the 15 pounds of fat. The dice were contained in a reinforced wire-mesh frying basket and stirred frequently during a 10-minute frying period. In commercial practice, the processor probably would want to operate at a higher frying temperature and for a shorter frying cycle than was used in this laboratory study. The temperature of the frying bath fell from the initial 320° F. to about 265° F. shortly after the charge was added, and then slowly increased to 320° F. Immediately after completing the frying, the cubes were centrifuged for about 10 minutes at 2,000 r.p.m. to remove excess surface fat. Centrifuging produced more attractive pieces because of their "drier" appearance and freedom from a greasy feel in the mouth. These experimental conditions were used for the preparation of 20 pounds of potato "nuts" for demonstration purposes at the United Fresh Fruit and Vegetable Association's annual meeting held in New York City in January 1955.

Only two kinds of fat were used in this experimental work: Cottonseed oil and hydrogenated vegetable shortening. Samples fried in cottonseed oil seemed to have a slightly drier appearance, but little difference in flavor could be detected between samples prepared in these two fats. Potato "nuts" prepared by our method contained 26 to 28 percent fat and 6 to 8 percent moisture.

FACTORS IN OBTAINING CRISP TEXTURE

In preparing potato "nuts", we stop the frying when the cubes are browned to the desired extent although the oil bath is still frothing due to ebulition of the water. Freshly fried cubes are crisp at the surface and firm at the center. They apparently lose moisture during cooling. If packaged while warm, moisture commonly condenses on the inner walls of the package and the pieces become tough and chewy probably because of migration of moisture from the interior to the surface crust. Hence, it is believed that potato "nuts" should be allowed to cool in a dry atmosphere before packaging. There are indications, as a result of a few experiments, that it might be well to conclude the processing by a step in which the potato "nuts" are heated in an oven.

This would drive additional moisture out without the necessity of frying until the pieces are overly browned. We do not at present have information on the optimum moisture content to which potato "nuts" should be fried or dehydrated, either from the standpoint of the quality of the freshly prepared product or of its storage properties.

FURTHER DEVELOPMENTS

Further developmental work on potato "nuts" is being conducted by the Maine Agricultural Experiment Station. Evaluation of the suitability of Maine potato varieties and further appraisal of the commercial potential of potato "nuts" are included in this program.